



**CHANUTE AFB
ILLINOIS**

**ADMINISTRATIVE RECORD
COVER SHEET**

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**PRELIMINARY REVIEW COMMENTS ON THE HAZWRAP/ASG
RISK ASSESSMENT-RELATED DOCUMENTS FOR THE
INSTALLATION RESTORATION PROGRAM
CHANUTE AIR FORCE BASE, ILLINOIS**

**Reviewer: Dr. Stephen Hsia (703) 883-5569
MITRE POC: Dr. Ray Osejo (703) 883-6992**

GENERAL COMMENTS

The following Chanute AFB documents have been reviewed by the MITRE Corporation at the request of AFCEE/ESB: (1) *Draft Baseline Risk Assessment Methodology: Evaluation of PAHs and Dermal Exposures for the Chanute Air Force Base Remedial Investigation Report* (January 1994); (2) *Preliminary Framework Human Health Risk Assessment for Eleven Sites: Site Conceptual Model, Potential Pathways and Receptors*, including attachments (December 1993), and (3) a preliminary draft of a document entitled *Conceptual Model* (undated) concerning ecological risk assessment.

The documents were prepared for use in completion of the Remedial Investigation/Feasibility Study (RI/FS) Report for eleven IRP sites at the base. Although this work is being conducted by HAZWRAP, it will have considerable impact on the selection of remedial alternatives and establishment of cleanup goals for the remedial design/remedial action (RD/RA) work for these sites, to be conducted under AFCEE supervision.

These documents are generally well organized and clear. The proposed technical approaches and methodologies, for the most part, are consistent with the pertinent risk assessment guidance from the U.S. EPA. Overall, the presentation regarding human health risk assessment issues is of a higher quality than that involving ecological risk assessment. There are, however, several particular portions of the documents that should be considered for revision to improve quality and usefulness of the documents. The remainder of this review will address these specific technical issues of major concern.

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SPECIFIC TECHNICAL COMMENTS

Draft Baseline Risk Assessment Methodology: Evaluation of PAHs and Dermal Exposure for the Chanute Air Force Base Remedial Investigation Report (January 1994)**1. Inhalation Slope Factors**

MITRE disagrees with the proposal that "the inhalation slope factor for benzo(a)pyrene be used as a surrogate for the quantitative assessment of inhalation exposures to (all other) carcinogenic PAHs" (Section I. third bullet, second paragraph). The proposed approach would significantly overestimate the overall carcinogenic risk from inhalation of PAH compounds. MITRE recommends the use of an alternative approach that is both realistic and scientifically defensible. This approach is based on the toxicity equivalency factor (TEF) methodology for carcinogenic PAHs [other than benzo(a)pyrene] that has been proposed in the U.S. EPA *Supplemental Region IV Risk Assessment Guidance* (February 1992).

2. Dermal Absorption Factors

MITRE suggests that the proposed dermal absorption factor (ABS_{derm}) for dioxin, 100%, be significantly modified. Chanute AFB should use a more realistic and experimentally derived ABS_{derm} value that has been recommended by the U.S. EPA in its guidance entitled *Dermal Exposure Assessment: Principles and Applications* (January 1992). The recommended ABS_{derm} value would be 0.1% for TCDD for soils with high organic content; and 3% for TCDD for soils with low organic content, and for all other dioxins. The proposed ABS_{derm} values for dioxin as well as those being proposed for DDT and anthracene derived using a theoretical model published by McKone are grossly conservative (i.e., it would overestimate the extent of dermal uptake from a soil matrix). It is also of interest to note that the following ABS_{derm} values (including the soil matrix effect) have been recommended by the U.S. EPA Region IV in determining the risks associated with dermal exposure to contaminated soils: 1.0 % for organics; and 0.1 % for inorganics (see U.S. EPA's *Supplemental Region IV Risk Assessment Guidance*, February 1992).

Preliminary Framework Human Health Risk Assessment for Eleven Sites: Site Conceptual Model, Potential Pathways and Receptors; Attachment A: Exposure Factors; Attachment B: Example Summary Quantitative Risk Tables (December 1993)**1. Current Agricultural Workers**

The contractor has proposed to calculate the risk associated with the ingestion of contaminated beef by current agricultural workers, an exposure pathway involving

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contaminated soil and bioaccumulation. All pertinent exposure parameters are presented in Table A-2. However, the suggested exposure frequency of 350 days/year is overly conservative. It is known that due to conservation considerations, the current crop production practice is limited to a corn-soybean rotation (see *Chanute AFB Cropland Management Plan*, 1986). There is no indication that these agricultural workers are raising beef cattle. MITRE recommends that the contractor conduct a survey and use more realistic site-specific information in estimating the risk associated with this particular exposure scenario. In addition, it may be necessary to perform a risk characterization regarding ingestion of contaminated dairy products if the survey indicates that this is a complete exposure pathway.

2. Current and Future Recreational Athletes

A recreational athlete has been considered by the contractor as a likely on-site receptor for both current and future exposure scenarios. However, the proposed soil ingestion rate (Table A-4) of 480 mg/day may not be an appropriate value to use in the risk calculation. The exposure scenario assumes 12-17 year-old males for sports. Thus, it is not consistent with the proposed soil ingestion rate (480 mg/day) which is the value recommended by the U.S. EPA to be used for certain outdoor activities in the commercial/industrial setting (e.g., construction or landscaping), according to the guidelines specified in U.S. EPA's *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors"* (March 1991).

3. Ingestion of Contaminated Fish

In assessing the potential risks associated with both current and future on-site/off-site uses of surface water, the contractor has correctly proposed that the ingestion of contaminated fish be considered a likely exposure pathway. However, the proposed exposure frequency of fish, 350 days/year (Table A-8), may be overly conservative. The proposed exposure scenario presumably has to be with recreational/sports fishing which is not a year-round activity (considering the climate of Illinois, i.e., a long and cold winter season). Unless the contractor can document the existence of a receptor population dependent on subsistence fishing, more realistic site-specific exposure information should be used in this particular risk calculation.

4. Ingestion of Contaminated Home-Grown Produce

Assuming that vegetables grown in off-site gardens will receive irrigation from potentially contaminated groundwater in the future, the contractor has proposed to consider the ingestion of contaminated home-grown produce as a likely exposure pathway. While this future exposure scenario is a reasonable one, the proposed exposure frequency of produce, 350

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days/year (Table A-11), may not be an appropriate value to use in the risk calculation, in view of the short growing period for vegetables (90 days, see footnote of Table A-11) and the climate of Illinois (i.e., a long and cold winter season). MITRE recommends the use of more realistic site-specific information in assessing the risk associated with this particular exposure pathway.

Conceptual Model, Attachments A, B, & C (Undated, Ecological Risk Assessment)

1. Receptors Selected for Salt Fork Creek

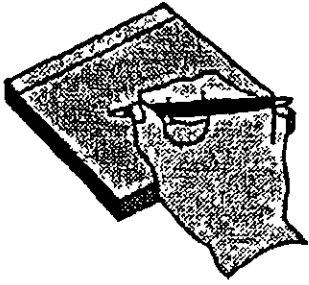
In the text, the mink has been considered as one of the ecological receptors selected for Salt Fork Creek due to the fact that the mink is an important fur-bearer and is highly susceptible to substances which bioaccumulate. However, in the ecological exposure analysis presented in Attachment C, the mink is not mentioned. Clarification/correction regarding this issue should be provided in the revised document.

2. Use of the Hazard Quotient

The contractor has proposed the use of the *hazard quotient (HQ)* method that is based on comparison between the observed (or calculated/modeled) exposure concentration and an effective contaminant (or a surrogate) concentration. While this is a reasonable approach to take, the contractor should provide clarification regarding the selection of the *benchmark (CTV)* values to be used in the various *exposure/ecological equations* presented in Attachment A. For example, what would the contractor do when toxicity data for receptor species are not available? What would the contractor do when NOEL ("no observed effect level")-type values are used as a surrogate for effective concentration?

3. Dermal and Inhalation Pathways

Ecological equations have been included in Attachment A for the calculation of HQs for both dermal and inhalation exposure pathways. However, the equation for dermal contact/inhalation exposure involving surface water (see Section 3, entitled *Surface Water - Dermal Contact/Inhalation*) is missing, and pertinent parameters associated with inhalation exposure are not provided. Also, the contractor has proposed the use of an ingestion benchmark value instead of a dermal benchmark value for the dermal contact pathway. The contractor should address these apparent discrepancies in the revised document.

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Comments: Here are MITRE's comments on Hazwrap's

Risk Assessment Approaches & Methodologies, as presented
in the documents made available to us by them.
Hope this helps!

Ray Osejo

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